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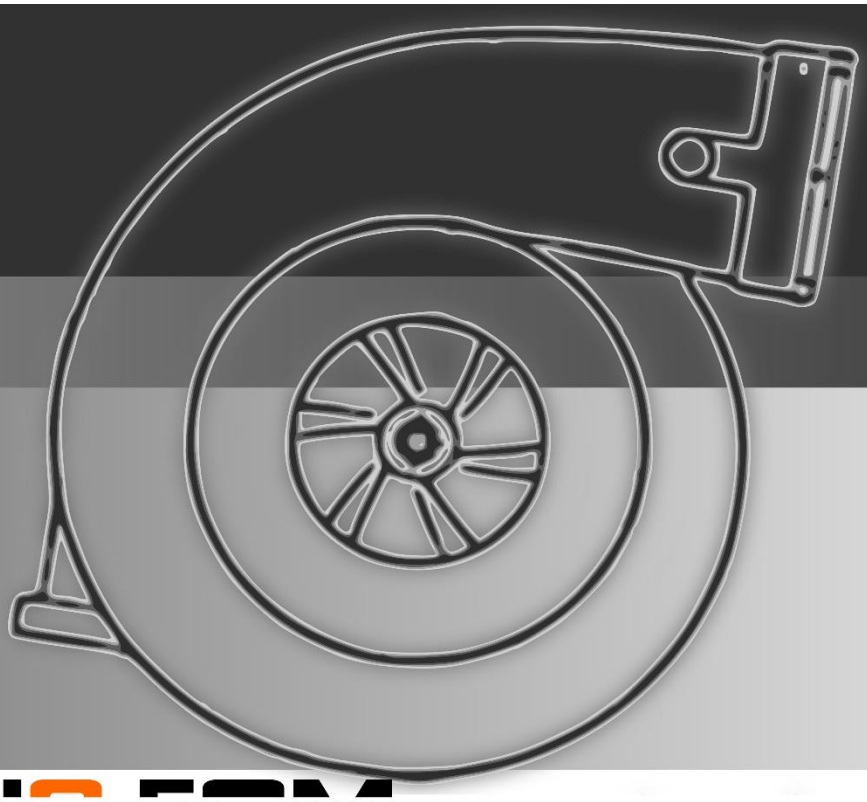
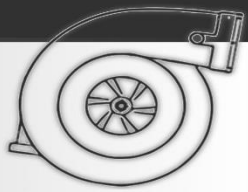
GEN8



GEN8 ECM

USB 8
UNIVERSAL SERIAL BUS

INSTALLATION MANUAL



POWER YOU CONTROL

Revision History

Version	Date	Modified Sections	Description
Draft Release - V1.0	05/02/15		
V1.1	22/02/15	ALL	General additions, corrections and updates
V1.2	02/07/15	Connector pin allocation	Fix connector pin diagram mistake
V1.3	07/07/15	Diagrams/appendix	Renamed and fixed map/tps pin out, added 2.5bar map install sheet.

Future include

Section	Description
Appendix	Lambda installation, add 3BAR map sensor
Pre intro	Electronic specification table
Loom info	Connector Disassembly guide
ECM mounting	Mounting template for ecm and USB
Loom select tree	Tree to help determine which wiring scheme should be followed
Wire diagram	More diagrams to suit alternate installations
Software	Software installation section
Software	Start new project – load base map
Initial settings	Initial ECU software settings
Input/Output	I/O table with software names used
Input/Output	Output ratings and typical applications table
Input/Output	Wiring examples

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INTRODUCTION

The GEN8 is a highly adaptable engine control module capable of accurately controlling fuel injection and ignition timing based upon various sensor input data. The quality of sensor data is in part determined by the quality of wiring loom installation. This user manual sets out to instruct on all aspects of installation and operation and should be read properly before installation has begun.

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GENERAL BEST PRACTICE

It is very important that all connections to and from your engine control module be properly fused, terminated and routed. The wiring diagrams serve as guide only but do aim to indicate best practice with regard to routing and fuse ratings. As a general rule the fuse should have a current rating just above that of maximum operation current. For example if a load operates with a maximum current of 9A the fuse should have a rating of 10A.

Cable routing should be clean and well organised, all caballing passing through the vehicles bulk head should be clear of sharp edges and small radius bends, the transition though the bulk head should ideally be via a grommet to protect the wires from sharp edges. The supplied wiring loom is constructed using application appropriate tri-rated cable with a thermal rating of 105 deg Celsius. For this reason cable routing should avoid high temperature areas such as the exhaust manifold, cylinder head and block, contact with high temperature components will result in the degradation of cable insulation and could result in a short circuit which may cause damage to other vehicle wiring and your engine control unit.

The wiring loom in general should be well secured and strain relieved to avoid failure caused vibration related fatigue. Wiring which constantly moves will fatigue and fail. This can result in high resistance or open terminations and impair control unit functionality. It is suggested that heat shrink be used over naked terminations and wiring joints not only to insulate connections but also to avoid cable movement at the crimp or soldered joint. Cable ties and clips should be used to secure wiring to static objects such as the bulk head ensuring that cable is not pulled taught at any point. Securing wiring to the engine, dashboard or any other fixtures which could move is not appropriate and could cause later failure.

ECM MOUNTING

The GEN8 should be securely mounted within the vehicles cabin. The unit should not be mounted within the engine bay or in any other location where ambient temperatures exceed 45 Deg C or where the unit will be subjected to high levels of vibration or moisture. As a general rule the GEN8 should be mounted in a location so as to minimise wiring length whilst maintaining enough spare wire so that no part of the loom is ever strained or subjected to excessive vibration.

WIRING LOOM

The GEN8 has two main loom connections which will be referred to as grey and black. The grey connector has sensor and communication related connections and the black connector has high current and medium current output connections such as injector, ignition, idle output and digital noise immune inputs. Each connector has an individual loom to simplify installation and to improve performance by keeping electrically noisy wiring separate from sensor wiring.

Electrical noise from components such as the alternator, ignition coils and other switching devices can be conducted between parallel closely spaced wiring. For this reason the grey and black looms should remain apart and should not be routed together as much as is reasonably possible. Each loom should pass through separate bulk head holes with centre spacing of at least 10cm. In general each loom will terminate in different engine bay locations so separate well-spaced routing is achievable.

The GEN8 is supplied with two main loom options

1. BASIC – The basic loom has the minimum wiring required to operate a 4 cylinder engine with wasted spark and batch injection including various extra inputs/outputs

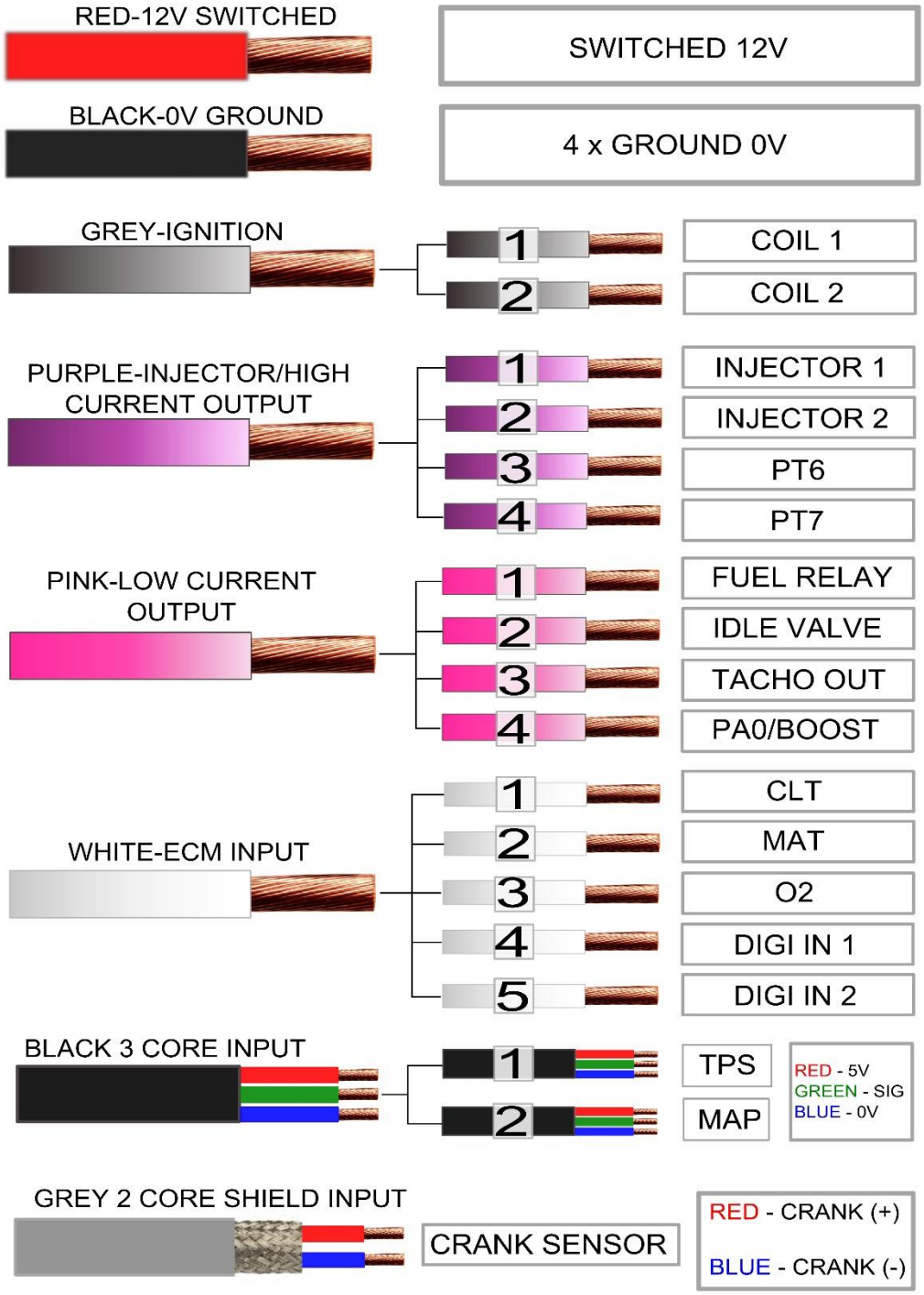
2. DELUXE – The deluxe loom has all available optional wiring included

By Default the BASIC loom is supplied with the GEN8 ECM, additional pin terminals may be purchased separately to in order to economically adapt the basic loom to suit specific installations please refer to the connector assembly section of this manual for information regarding the installation of additional pin terminals and wiring.

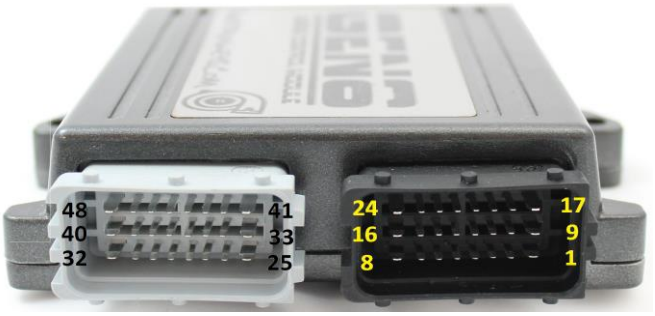
The following sections discuss the installation of the two supplied wiring looms. The wiring diagram selection tree should be used to determine which wiring diagram(s) should be followed to suit a specific application.

GEN8 WIRING LOOM COLOUR CHART (BASIC LOOM)

To simplify installation the wiring looms are colour coded with each colour symbolising a specific function. Individual wires are numbered at the top and bottom. The colour chart should be used to determine the function of all coloured and numbered wires.



CONNECTOR PINOUT



Grey		
Pin No.	**Function**	**Wire colour**
25	CRANK (+)	RED
26	CRANK (-)	Black
27	CAM (-)	x
28	CAM (+)	x
29	MAP 5V	RED
30	TPS GND	Blue
31	TPS 5V	RED
32	TPS SIG	Green
33	O2 0-5v input	White
34	AN IN 4/ADC2	x
35	Shield	Shield
36	MAP GND	Blue
37	MAP SIG	Green
38	MAT	White
39	CLT	White
40	SGND	Black
41	SGND	Black
42	USB SHIELD	Shield
43	USB GND	Black
44	USB 5V	RED
45	USB D+	White
46	USB D-	Green
47	CAN H	x
48	CAN L	x

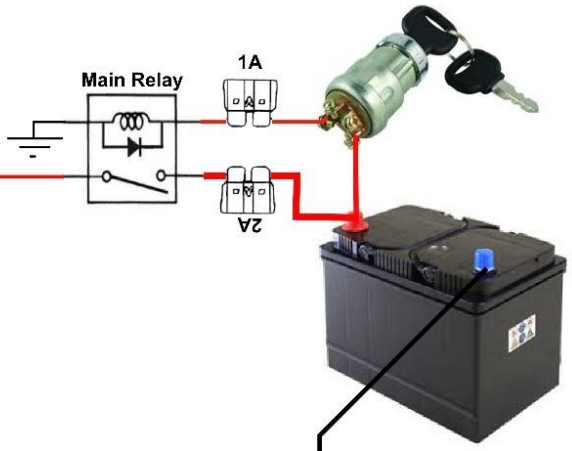
Black		
Pin No.	**Function**	**Wire Colour**
1	SPARK 1	Grey
2	PT6/INJ3	Purple
3	INJECTOR 2	Purple
4	INJECTOR 1	Purple
5	PT7/INJ4	Purple
6	DIGI IN 2/ADC1	White
7	12V Switched	Red
8	SPARK 4	x
9	SPARK 3	x
10	SPARE 6	x
11	SPARE 5	x
12	SPARE 4	x
13	SPARE 3	x
14	DIGI IN 3/FLEX	x
15	DIGI IN 1/PE1	White
16	SPARK 2	Grey
17	PGND	Black
18	SPARE 2	x
19	SPARE 1	x
20	BOOST/PA0	Pink
21	TACHO	Pink
22	IDLE	Pink
23	FUEL	Pink
24	PGND	Black

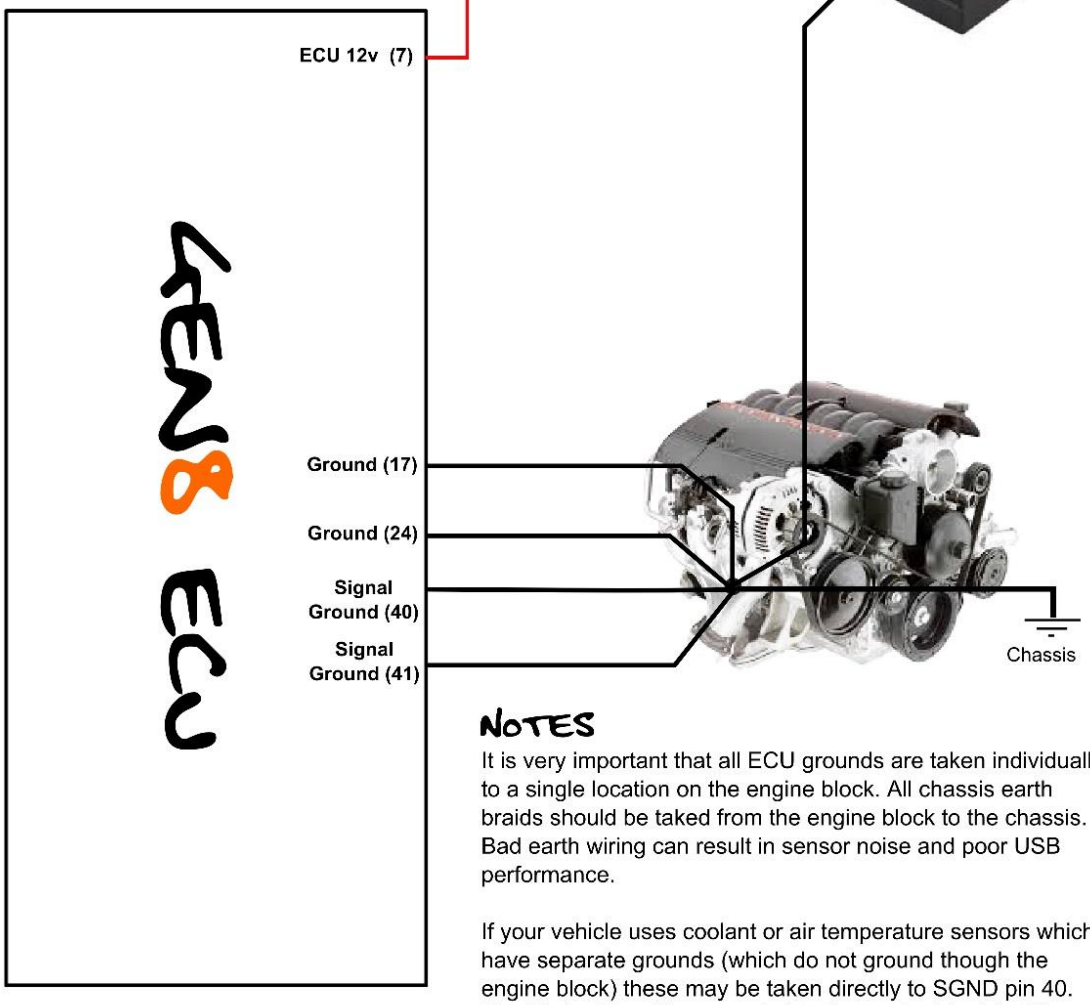
Notes:
See the GEN8 Option I/O table for information regarding programmable inputs and outputs
Installations which do not use INJECTOR 3 / 4 or SPARK 3 / 4 may use the outputs as standard high current programmable outputs

x	No wire is loom connected deliberately

WIRING DIAGRAMS

POWER AND EARTH





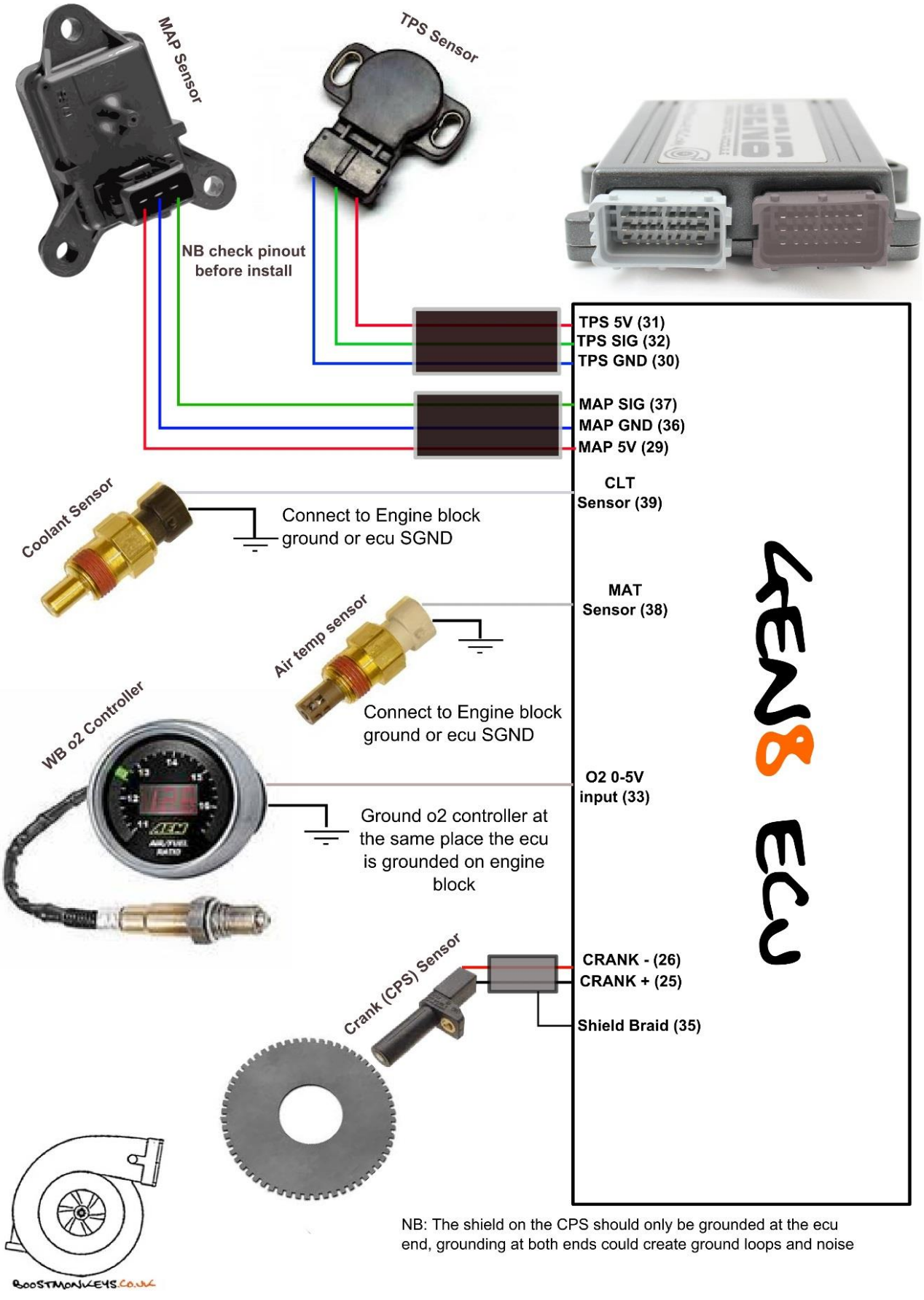
NOTES

It is very important that all ECU grounds are taken individually to a single location on the engine block. All chassis earth braids should be taked from the engine block to the chassis. Bad earth wiring can result in sensor noise and poor USB performance.

If your vehicle uses coolant or air temperature sensors which have separate grounds (which do not ground though the engine block) these may be taken directly to SGND pin 40. Pin 40 should not be grounded to the engine block in this configuration and connected ONLY to signal returns for the coolant and air temperature sensors.

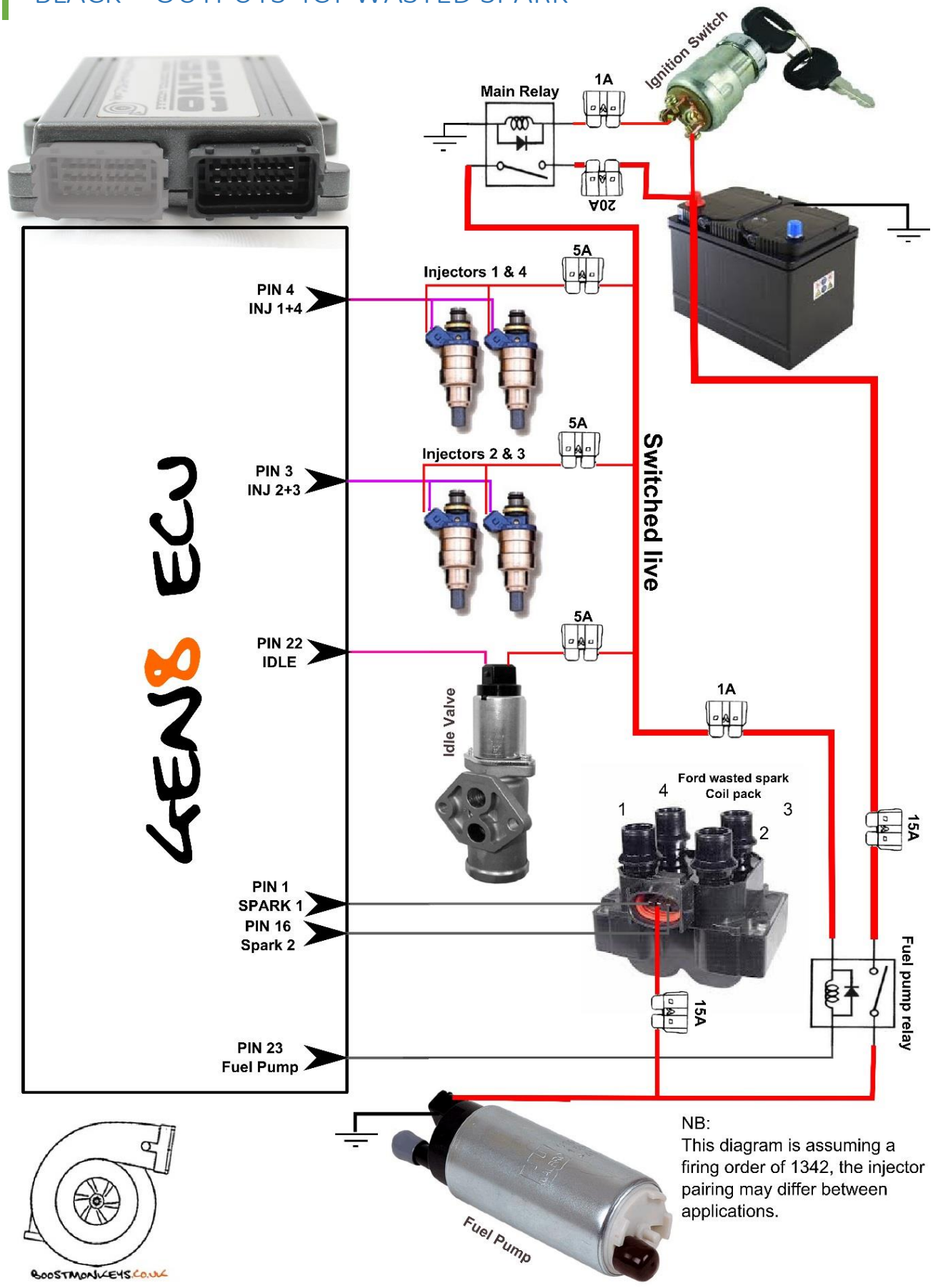
If you have problems where the o2 gauge and Tunerstudio AFR gauge give different readings your o2 controller should also be grounded to PIN 40 as above. The pin should not be grounded to the engine block in this instance either and only to the o2 controller (and CLT/MAT sensors if applicable).

GREY – GENERAL INPUTS



NB: The shield on the CPS should only be grounded at the ecu end, grounding at both ends could create ground loops and noise

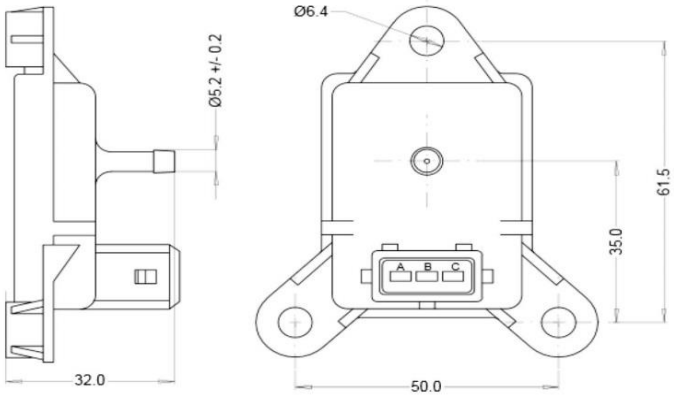
BLACK – OUTPUTS 4CY WASTED SPARK

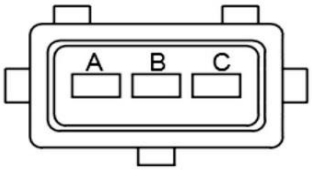


APPENDIX

2.5 BAR MAP SENSOR

2.5 BAR Map sensor





Connector Pin Out

PIN	description
A	+ 5 Vdc
B	GND
C	Signal OUT

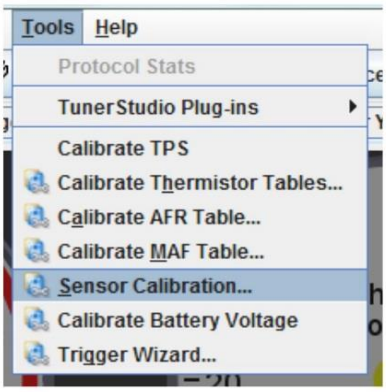
NOTES

The map sensor should be mounted within the engine bay on a solid platform. The bulk head or inner wing would be ideal locations. The Map sensor should be connected to the inlet manifold (after the throttle body!) via a silicon vac hose. This hose should be leak free and have enough slack that the hose is never pulled taught (remembering that the engine can rock by over an inch on it rubber mounts). If the hose were to become accidental crimped or detached at high load/RPM serious engine damage could occur so double check every connection to this sensor.

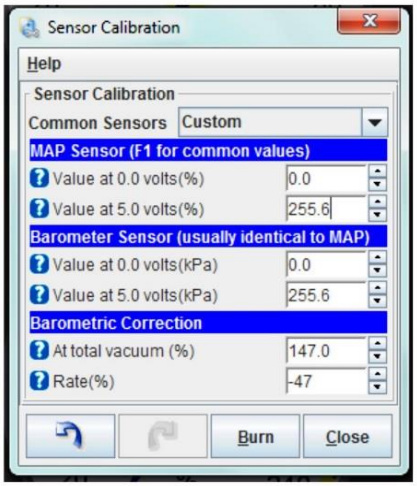
CALIBRATION DATA AND SETTINGS

1 OPEN TUNERSTUDIO AND SELECT TOOLS

2 SELECT SENSOR CALIBRATION



2 SELECT CUSTOM SENSOR AND ENTER THE VALUES SHOW BELOW



4 SELECT BURN WITH THE ENGINE OFF THE MAP SENSOR SHOULD GIVE A READING OF CLOSE TO 100KPA.